

Variation and Distribution of *Hemiargus huntingtoni*
(Lepidoptera: Lycaenidae)

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Abstract The history, ecology, and occurrence of *Hemiargus huntingtoni* is given, together with characters that are useful in the recognition of this species. Two new subspecific names are proposed: *continentalis*, from Colombia, and *hannoides*, from Mexico; nominate *huntingtoni* was described from Trinidad, and may occur in Venezuela.

The little blue that forms the subject of the present paper has had an unusual history. Not only did it escape notice until 1945, it was then independently discovered by two men. The late W. P. Comstock, in the course of his studies on West Indian and allied Lycaenidae had recognized as new a series of Trinidad specimens in the American Museum of Natural History; while at the Museum of Comparative Zoölogy V. Nabokov, engaged in unravelling the neotropical Plebejinae, found specimens, also from Trinidad, in the collection there.

Nabokov went on to publish his review of the Plebejinae and the species is well and prominently discussed there. Out of deference to Comstock's prior discovery and intended publication, however, Nabokov did not name the species and referred to it simply as "*Echinargus* n. sp." Comstock was not immediately able to realize his intention to name the species and eight years were to elapse before it was finally baptized, in 1953, under the joint authorship of F. H. Rindge and Comstock, as *Echinargus huntingtoni*.

Some years ago I arranged the neotropical Plebejinae in Carnegie Museum in accord with Nabokov's revisional studies and in the process was pleased to note a Trinidad series of *huntingtoni* that, not surprizingly, had been mixed in among the "*hanno*" material in the collection. Much more interesting, however, was the discovery of additional series of the species from the mainland—from Venezuela, from Colombia, and even—a single specimen only—from Costa Rica. Nothing further was done about the matter until 1960, when E. C. Welling sent for determination (and retention) a fine large collection of Yucatán lycaenids among which, most unexpectedly, was a series of *huntingtoni*. With such a vast extension of the known range now clearly in evidence, not to mention the fact that at least two distinct new subspecies were indicated, a first draft of the present paper was prepared. Further work on it was postponed when it became evident that in 1961 I would be in Mexico with the Margaret M. Cary-Carnegie Museum Expedition to Baja California, and would be collecting in what might well be *huntingtoni* country. We did indeed obtain a short series, discussed below in more detail.

The final episode in this story, and the one which has urged the publication of this paper now (rather than with the results of the Cary-Carnegie Expedition, where I had intended to give the information) was the recent receipt for identification of a collection of Mexican lycaenids made by Mr. Gary N. Ross, of

Louisiana State University. Mr. Ross' material, from southern Veracruz, also contained specimens of *huntingtoni*. Since he needs a name for his specimens, this paper is being published now.

ECOLOGY AND OCCURRENCE

Aware of the possibility of collecting *huntingtoni* on the Cary-Carnegie Expedition, and equally aware that it might not be possible to distinguish it in the field from *ceraunus* (particularly *ceraunus gyas*), we determined to make a special effort to secure all the *ceraunus*-like material we could, wherever we collected. The result was roughly 150 specimens from mainland localities, scattered from near Riito at the mouth of the Colorado River to Mazatlán and the mountains nearby; and nearly 300 specimens from Baja California, all from the region south of La Paz (to which the expedition's efforts were confined), from sea level to over 3,000 feet.

Of this welter of specimens only five males turned out to be *huntingtoni*, and all were from a single locality near Mazatlán. The locality was about 16 miles north of the city, along a little-used dirt road just east of the main highway. Vegetation zones in the vicinity of Mazatlán are distributed in a rather complicated way, with several meeting in the area, each with a number of distinctive subtypes, and all interdigitating. The whole is further complicated by the changes wrought by present and former agricultural use of the land. The prevalent zone immediately around the city appears to be thorn forest,¹ which gives way to the east to tropical deciduous forest, a distinctly more mesic environment that runs in a belt along the western foothills of the Sierra Madre Occidental. The *huntingtoni* locality is in the latter zone, the road traversing a humid forest, with a completely closed canopy and much herbaceous ground cover. The specimens of *huntingtoni* were taken along the road itself which, though open to the sky above, is a distinctly shaded situation. Indicative of the shade and the general ecology, it was one of the few places where we obtained *Euptychia hermes*, a shade-dwelling satyrid, and in the herbaceous ground cover of the forest beside the road we obtained some half-dozen *Bittacus* (Mecoptera), whose shade and moisture requirements are well known.

In marked contrast, true *ceraunus*, wherever we found it, was a dweller of open, sunny areas. It is common almost everywhere in desert and thorn forest country, but occurs also in cut-over or otherwise generally open, sunlit areas in the tropical deciduous forest and even in the lower (pineless) levels of the pine-oak forest (where we obtained it in the mountains east of Mazatlán and again in the mountains south of La Paz on the peninsula). It is interesting and probably significant that no *ceraunus* at all were taken in the *huntingtoni* locality.

¹Zone terminology is from A. S. Leopold, 1950 (*Ecology* **31**: 507-518), as modified in Leopold, 1959 (*Wildlife of Mexico*: Univ. Cal. Press). The map given in the latter publication is also available in M. W. Pesman, 1962 (*Meet Flora Mexicana*: Dale S. King, publ.).

Hemiargus (Echinargus) huntingtoni Rindge & Comstock

One of the principal reasons for the belated recognition of *huntingtoni* is its close resemblance to *Hemiargus (Hemiargus) hanno* Stoll and *ceraunus* Fabricius, with one or the other (and, in Costa Rica, both) of which it is sympatric everywhere in its range. The only wholly reliable means of distinguishing it is by genitalic dissection (cf. Nabokov, *l.c. infra*). Three traits of pattern, however, are consistent and reasonably diagnostic:

(1) The brown color of the postbasal spot in the discal cell of the hind wing below, which is black in almost all of the hundreds of *hanno* and *ceraunus* examined (though in these species it usually appears brown if the specimen is worn).

(2) The subterminal row of white lunules on the female hind wing above. The largest of these lunules caps the Cu_1-Cu_2 black spot and is present, though somewhat variable in its expression, in all *huntingtoni* females I have seen and absent in all *hanno* and *ceraunus*.

(3) Also in the female, the thin white terminal line of the hind wing above, passing just distad of the Cu_1-Cu_2 black spot: present in *huntingtoni* (though it may be reduced to the segment in Cu_1-Cu_2 only), absent in all *hanno* and *ceraunus*.

Regionally, additional differences may exist, such as the two large subterminal black spots on the hind wing below in *ceraunus zachaeina* Butler & Druce of Central America, easily separating it from the always single spot of *huntingtoni*. In spite of these differences, however, *huntingtoni* bears a striking similarity to *hanno* and *ceraunus* and there must be many specimens of it in collections masquerading as one or the other of these species.

It is interesting to note that all three of the above enumerated traits of *huntingtoni* are also characteristic of *isola* Reakirt, a member of the same subgenus but in general appearance otherwise quite different and unmistakable.

Hemiargus (Echinargus) h. huntingtoni Rindge & Comstock

"*Echinargus* n. sp." Nabokov 1945, *Psyche* **52**: 27, 29-31, pl. 5 figs. N.SP. 1-3, pl. 7 figs. N.SP. 1, 1a, 2, 4, pl. 8.

Echinargus huntingtoni Rindge & Comstock 1953, *Journ. N. Y. Ent. Soc.* **61**: 99-100.

The typical subspecies has the fuscous border of the male above thin: at Cu_1-Cu_2 of fore wing it is less in thickness than the distal width of that interspace; the Cu_1-Cu_2 subterminal black spot of the hind wing, with a row of smaller, browner spots thence costad to apex, separated from the slender fuscous terminal line by a thin whitish line. On the fore wing the blue-violet ground color is faintly paler distally next to the fuscous border which it thus sets off contrastingly. The female above has the subterminal white lunules and the terminal white line both strongly developed.

So far known only from Trinidad (Tacarigua and Carenage: 9 males and

one female in C.M.; additional localities given by Rindge & Comstock). One of our Venezuelan males (see below) is very close—close enough to make me suspect that typical *huntingtoni* may occur also on the mainland near Trinidad.

Hemiargus (Echinargus) huntingtoni continentalis n. ssp.

MALE Fore wing above with fuscous border very thick—at Cu_1 – Cu_2 twice or more as thick as distal interspace width, and thickening still more costad, in several specimens extending basad almost to cell-end. Hind wing above with the terminal whitish line obsolete except in Cu_1 – Cu_2 , distad of the black spot which is large and blacker than the fuscous border in which it lies.

FEMALE Hind wing above with subterminal lunules faint, the Cu_1 – Cu_2 black spot large and contrastingly black, the thin terminal pale line duller, obsolescent everywhere except just distad of the black spot.

Underside of both sexes as in the typical subspecies.

LENGTH OF FORE WING Males, 9–10 mm, mean (6 specimens), 9.25 mm; female, 9–10.5 mm, mean (3 specimens), 9.83 mm.

HOLOTYPE Male, Minca, 2,000 ft., Colombia, 25.v (leg. H. H. Smith), *ex coll.* Holland. *Paratypes*: 1 male, 2 females, same locality and collector, vi; 3 males, 1 female, Cacagualito, 1,500 ft., Dept. Magdalena, Colombia, v; 2 males, Bonda, 250 ft., Dept. Magdalena, Colombia (no date): all leg. H. H. Smith, *ex coll.* Holland. These localities are all in the Santa Marta Mts. region. C. M. Ent. type series no. 472.

REMARKS From the area between Trinidad and the Santa Marta Mts., which lie some 850 miles west of Trinidad, a few additional specimens are at hand: a pair from Puerto La Cruz, Distr. Federal, Venezuela (15.xii.1928, leg. E. G. Holt), about halfway between the two, and a single male from Anzoatequi, Estado Lara, Venezuela (ii.1911, leg. M. A. Carriker), about 250 miles east of the Santa Martas. Despite the fact that it is so near the type locality of *continentalis*, the Anzoatequi male resembles the nominate subspecies almost exactly, while the two from Puerto La Cruz are more like *continentalis*, though the subterminal white lunules of the female are nearly as prominent as in *huntingtoni* s.s. Without series, of course, it is impossible to determine whether this curious inversion of attributes is merely an artifact of the small samples or something more significant.

Hemiargus (Echinargus) huntingtoni hannoides n. ssp.

? *Lycaena hanno* (*partim*): Godman & Salvin 1887, Biol. Centr. Amer., Lep. Rhop. **2**: 106–107 (Mexico: Mazatlán; Ventanas²); *ibid.* 1901, op. cit.: **723** (Mexico: Acapulco; Dos Arroyos; San Blas; Bolaños. Nicaragua: Matagalpa).

? *Hemiargus hanno*: Hoffmann 1940, An. Inst. Biol. Mex. **11**: 721 (“Tierras templada y caliente del Sur y de toda la Region del Golfo. En la Region del Pacifico hasta Sonora.”).

MALE Both wings with the fuscous border as thin as in the nominate subspecies; the blue color a little darker and more purple, with no trace of terminal lightening; hind wing with Cu_1 – Cu_2 subterminal spot faint, often apparently showing through by transparency more

² Now Villa Corona, Durango; cf. R. G. Webb & R. H. Baker 1962, Amer. Midl. Nat. **68**: 332.

than anything else; no subterminal fuscous spots costad of it and no trace of a thin terminal white line other than a very faint suggestion distad of the spot in Cu_1-Cu_2 .

FEMALE Hind wing with subterminal whitish lunules clearly present in $M_3-Cu_1-Cu_2-2A$, more faintly present costad; terminal whitish line dull, barely visible except in Cu_1-Cu_2 where it is sharp and distinct.

LENGTH OF FORE WING Male, 9-10 mm, mean (4 specimens), 9.5 mm; female, 10 mm (2 specimens).

HOLOTYPE Male, Pisté, Yucatán, Mexico, 30.vii.1959 (*leg.* E. C. Welling), C.M. Acc. 19704, slide no. C-788 (male genitalia). *Paratypes*: 2 males, same data as holotype except respectively 3.vii.1959 and 10.xii.1960; 1 male, 1 female, Chichén Itzá, Yucatán, 25-26.ix and 31.xii.1954 (Welling); 1 female, X-Yaaxchexlabpak, Yucatán, 25.vii.1954 (Welling), C.M. Acc. 17351. C.M. Ent. type series no. 473.

REMARKS In addition to the type series specimens have been examined (with one exception, indicated) from the following localities:

(1) 7 mi NNE of Acayucan, 350 ft., Veracruz, Mexico, 3.vii.1962 (*leg.* Gary N. Ross), 2 males.

(2) 2 mi NE of Catemaco, 1,100 ft., Veracruz, Mexico, 4.x.1962 (*leg.* G. N. Ross), 1 female.

(3) 5 mi NNE of Catemaco, 2,200 ft., Veracruz, Mexico, 4.vii.1962 (*leg.* G. N. Ross), 1 male, 1 female [not seen; record furnished by Mr. Ross, *in litt.*].

(4) 16 mi N of Mazatlán, Sinaloa, Mexico, 29.x.1961 (*leg.* N. D. Richmond, H. Clench and J. Bauer, Cary-Carnegie Exp.), 5 males.

(5) San Mateo, Costa Rica, i (*leg.* Wm. Schaus), 1 male.

Provisionally these may all be referred to *hannoides*, despite a certain heterogeneity (the Costa Rican male is particularly distinct).

Mr. Ross has written that at locality (1) above the *huntingtoni* were "abundant . . . in an oak-savanna"; at locality (3) somewhat less abundant, "in a grassy meadow in which oaks were common"; while at locality (2), in an open field with no oaks around, "very uncommon; only this one specimen here the whole six months." As at the locality near Mazatlán, the presence of a generally shaded mesic situation is evident, despite the rather different regional vegetation. The single female at locality (3), we may suppose, was a stray from a more favorable environment nearby.

The listing of "*hanno*" by Godman & Salvin and by Hoffmann can hardly refer to anything but *huntingtoni hannoides*, for it is the only "one spot" form in the area likely to be taken for *hanno*. In northwestern Mexico one-spotted *ceraunus* occurs (subspecies *gyas* Edwards and intergrades), but localities in this area are not mentioned by either, save for Hoffmann's reference to Sonora.

It is possible that *huntingtoni* will be found eventually in the United States. It is most likely to occur in extreme southern Texas.